

SECTION 2

Initial Evaluation and Sampling Rationale

This section presents a site summary, previous investigation results (if any), and sampling rationale for the sites (nine SWMUs and three AOCs) included in the Phase I RFI.

Previous studies performed in these areas include an RFA completed by A.T. Kearney, Inc., on October 13, 1988, an updated RFA completed by PREQB on September 27, 1995, and an initial field sampling investigation at five of the sites located at Camp Garcia (SWMU 4, SWMU 6, SWMU 7, SWMU 10, and AOC F) performed by CH2M HILL in June 2000. The purpose of the initial field sampling investigation of the five Camp Garcia sites was to evaluate potential contamination at the sites because they were planned for use by Naval Ammunition Support Detachment (NASD) activities that were in the process of being relocated from the western portion of Vieques to Camp Garcia. No previous investigations at the seven other sites have included environmental sampling.

In addition to these previous studies, CH2M HILL visually inspected the sites in February and June 2000 to assess the current condition of the sites.

2.1 SWMU 1 – Camp Garcia Landfill

2.1.1 Site Summary

According to the RFA, the Camp Garcia Landfill is located in the EMA approximately 4,000 feet north-northwest of Blue Beach, approximately 3,000 feet east of Camp Garcia (PREQB, 1995).

According to the IAS, the landfill was in operation from approximately 1954 to 1978, when it became inactive. When the landfill was operational, it was used for the disposal of waste paper, corrugated containers, cans and food packaging material, rags, scrap metal, and yard waste. Normal trash (food waste, waste paper, etc.) from both Camp Garcia and the Inner Range of the AFWTF was also disposed at the landfill. The landfill was not lined. It serviced approximately 150 individuals, depending on military exercises. One 5-ton dump truck was used every day, 5 days per week, to dispose waste at this site. According to PREQB (1995), approximately 1,800 to 3,120 tons of waste was distributed over the 100 to 200 acre area. An aerial photo analysis of the landfill, however, indicated that the fill area extended over an area of approximately 55 acres (ERI, 2000). When operation of the landfill ceased in 1978, a cap consisting of compacted native soils was installed. Today, the landfill is vegetated with dense grasses. A gravel road was constructed down its center in the mid-1980s. During the 1995 RFA (PREQB, 1995), no signs of erosion or stresses on vegetation were observed in the landfill area, and no documentation was found regarding releases of hazardous constituents from the landfill.

During the February 2000 CH2M HILL site visit, no signs of previous landfill activities were visible at the site. The site was heavily vegetated (see Figure 2-1).

The approximate landfill boundary line shown on Figure 2-2 was drawn only to provide a preliminary estimate of the extent for SWMU-1, which encompassed the evident landfill cells and trenches. This line has been relabeled as SWMU-1, not approximate landfill boundary. The landfill boundary will be determined after interpreting the results of the geophysical survey.

2.1.3 Sampling Rationale

Based on the review of the limited information available for the site, CH2M HILL will conduct a geophysical survey over the former landfill area and install five groundwater monitoring wells. The geophysical survey will use magnetic and/or electromagnetic methods to map the aerial extent of former disposal cells and trenches. Geophysical transects will be run on approximately 100-foot line spacings in both east-west and north-south directions over the former landfill areas mapped from aerial photographs. Data will be collected digitally and location will be maintained using a Global Positioning System (GPS).

The geophysical survey transects will be located based on the locations (latitude and longitude) of the former landfill cells and trenches determined through interpretation of aerial photographs of the site (ERI, 2000).

The five groundwater monitoring wells will be installed based on the results of the geophysical survey at the locations shown in Figure 2-2. One well will be installed hydraulically up-gradient and four wells will be installed downgradient from former landfill cells. The ERI aerial photograph interpretation results will be used to site the monitoring wells. If subsequent groundwater flow maps indicate that the wells are not installed downgradient from the former landfill cells, additional wells may be required to adequately monitor the site. All wells will be screened in the shallow surficial aquifer. The monitoring wells will be installed at a depth of less than 10 feet below the first encountered groundwater using a 10-foot screen in order to allow detection of potential floating free phase product, if any, at the groundwater/vadose zone interface.

The Navy will implement institutional controls to preclude any intrusive activities in the landfill area. The types of controls will be based on the results of the risk assessment that will be completed for the RFI. The institutional controls will limit subsurface excavation through the fill material.

Groundwater samples will be analyzed for Appendix IX constituents and explosives. Although historical information for SWMU 1 does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, and the public concern regarding explosives and related residues at the AFWTF.

2.2 SWMU 2 – Fuels Off-Loading Site (Camp Garcia)

2.2.1 Site Summary

Site SWMU02 is located at Camp Garcia, and is the former location of four aboveground fuel storage tanks (ASTs). Two 20,000-gallon tanks and two 30,000-gallon tanks which were used to store diesel fuel, leaded gasoline, AVGAS, and JP-5 fuel. These tanks became operational in 1953 and were removed between 1978 and 1979. Tank refueling occurred every 3 months, and involved pumping fuel from a barge through an 8-inch submarine line to each of these tanks. Prior to initiating the refueling, seawater had to be flushed from the submarine line, during which approximately 1,000 gallons of fuel was reportedly discharged into the ocean and onto the soil along the shoreline in the vicinity of the concrete loading ramp at the shoreline. According to the IAS, this refueling process took place for approximately 25 years; therefore, approximately 100,000 gallons of fuel was potentially discharged during this period of time.

The sludge that accumulated in the bottom of the tanks was periodically removed by a private contractor and disposed of on the main island of Puerto Rico.

The site is currently overgrown with grass and small shrubs, with only minimal signs of previous activity consisting of the concrete loading ramp and the steel pipeline supports next to the loading ramp. During the 1995 RFA (PREQB, 1995), no signs of previous releases of fuel to either the soil at the site or the ocean along the shorelines were apparent, and no release controls were identified. These same conditions were observed during the CH2M HILL February 2000 site visit.

2.2.2 Previous Investigation Results

No previous environmental sampling investigations have been conducted at this site.

2.2.3 Sampling Rationale

Based on the review of the limited information available for the site, CH2M HILL will collect 12 surface soil (0 to 6 inches) samples and install two soil borings at locations illustrated on Figures 2-3 and 2-4. Eight surface soil samples will be collected and one soil boring will be installed from the area of the four fuel tank pads (two surface soil samples from each pad area) as shown in Figure 2-3. The ERI aerial photograph interpretation and existing concrete pads will be used to identify the former tank locations and soil sampling locations. Four surface soil samples will be collected and one soil boring will be installed near the two fuel pipe supports in the concrete ramp area (two surface soil samples from each pipe support area) as shown in Figure 2-4. The soil borings will be installed to 15 feet below land surface (bls) and soil samples will be screened continuously with an organic vapor analyzer (OVA). Three samples with the highest OVA values will be submitted for laboratory volatile organic compound (VOC) and semi-volatile organic compound (SVOC) analysis. Surface soil samples will be analyzed for Appendix IX constituents and explosives. Although historical information for SWMU 2 does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, the potential for airborne migration of explosives residues via fugitive dust emissions, and the public concern of explosives and related residues at the AFWTF.

2.3 SWMU 4 – Waste Areas of Building 303 (Camp Garcia)

2.3.1 Site Summary

The SWMU 4 waste areas located in Building 303 at Camp Garcia include a spent battery accumulation area, a catch basin for hydraulic oil, a cleaning/degreasing basin, and a storage area for waste rags, absorbent material, and grease. Per the classifications in the 1988 and 1995 RFAs, the oil catch basin, cleaning/degreasing basin, and storage area for rags, absorbent material, and grease were designated as AOCs C, D, and E, respectively. The areas have since been determined to be SWMUs. Because they are all located inside or adjacent to Building 303 at Camp Garcia, they were all included as one SWMU (SWMU 4). Locations of AOCs C, D, and E at SWMU 4 are illustrated in Figure 2-5.

The battery accumulation area consists of a small building adjacent to Building 303 designated as “Corrosive Materials Storage.” In the past, it contained spent batteries and battery acid, which were disposed of offsite at Naval Station Roosevelt Roads (NSRR). According to the 1995 RFA (PREQB, 1995), this building was established as a storage area for batteries ever since it was erected in the 1960s. During the 1995 RFA, no batteries or acid were present at this location, nor were there visible signs of acid leakage on the concrete floor from previous storage of these materials. These same conditions were observed during the CH2M HILL February 2000 site visit.

The catch basin for hydraulic oil (formerly AOC C) is approximately 5 feet long and 6 inches wide, and is located inside Building 303. It was designed to catch spills and leaks of hydraulic oil from vehicles during maintenance operations. During the 1995 RFA (PREQB, 1995), no signs of leakage were noted on the cement floor under the basin. These same conditions were observed during the CH2M HILL February 2000 site visit, although this area could be viewed only through a locked chain link fence at the time of the visit because the building was locked.

In the past, the storage area for rags, absorbent material, and grease (formerly AOC E) contained barrels of waste grease, rags, and absorbent materials generated during cleanup of spills within Building 303. This area consists of a small building located adjacent to Building 303 and is designated as “Flammable Storage.” According to the 1988 and 1995 RFAs, spent batteries were also once stored in this area. During the 1995 RFA (PREQB, 1995), no signs of spills were noted. This same condition was observed during the CH2M HILL February 2000 site visit.

2.3.2 Previous Investigation Results

Because of the ongoing transfer of NASD activities to Camp Garcia, CH2M HILL conducted a surface soil sampling investigation at SWMU 4 in June 2000. Twelve surface soil samples were collected from a depth of 0 to 6 inches in the areas of the Corrosive Materials Storage Building (spent battery accumulation area), Flammable Materials Storage Building (area of rags, absorbent material, and grease - AOC E), and near Building 303 adjacent to the inner catch basin for hydraulic oil (AOC C). Figures 2-6 and 2-7 show the surface soil sample locations surrounding these areas at Building 303. As shown, five samples were collected around the Corrosive Materials Storage Building, five samples were collected

around the Flammable Materials Storage Building, and two samples were collected outside of the catch basin area. The samples were analyzed for Appendix IX constituents and explosives. The surface soil sampling results indicated that only arsenic was detected above the residential risk-based criterion (RBC). The presence of arsenic in the soil is probably naturally occurring, which is expected given the volcanic origin of the soils on the island. Analytical results will be included in Phase I RFI Report along with the analytical results of the proposed background study. The results from both investigations will be used to determine whether additional investigations are warranted.

2.3.3 Sampling Rationale

As discussed in Section 1, a background study for metals is proposed for the AFWTF to determine the levels of naturally occurring metals in soil and groundwater. Further surface soil sampling at SWMU 4 will not be undertaken if the arsenic identified is determined to be naturally occurring. Risk-based screening results for the June 2000 sampling effort will be presented in the Phase I RFI Report.

During the time of sampling, inside access to Building 303 was not available. To sample for areas associated with the catch basin for hydraulic oil, one soil boring will be installed to a depth of 5 feet outside of Building 303 and adjacent to the hydraulic oil catch basin. Samples will be collected continuously (every 2 feet). Soil samples will be screened in the field with an OVA. One sample will be collected for analysis from the boring. The soil sample will be analyzed for VOCs and SVOCs. The sample with the highest OVA reading will be selected for analysis. If no vapors are detected with the OVA, the sample will be collected from a depth of 5 feet.

If the degreasing basin can be located, an additional soil boring will be installed to a depth of 15 feet at the degreasing basin. If the degreasing basin is located in the middle of Building 303, the boring will be installed through the concrete floor. Samples will be collected continuously (every 2 feet). Soil samples will be screened in the field with an organic vapor analyzer (OVA). Four samples will be collected from the boring for analysis. The soil samples will be analyzed for VOCs and SVOCs. The samples with the highest OVA readings will be selected for analysis. If no vapors are detected with the OVA, the samples will be collected at land surface (0-6 inches) and every five feet for laboratory analysis (i.e., 5, 10, and 15 feet).

Building 303 will be inspected for potential floor drains and dry wells. If a dry well is found, a boring will be installed to a depth of 15 feet, using the same sampling procedure as described above. Samples will be collected continuously (every 2 feet). The soil samples will be analyzed for VOCs and SVOCs. The samples with the highest OVA readings will be selected for analysis. If no vapors are detected with the OVA, the samples will be collected at land surface (0 to 6 inches) and every 5 feet for laboratory analysis (i.e., 5, 10, and 15 feet).

2.4 SWMU 5 – Spent Battery Accumulation Area (Observation Post 1, Inner Range, AFWTF)

2.4.1 Site Summary

SWMU 5 is located in the vicinity of OP-1 at the Inner Range of the AFWTF. The area is similar to SWMU 4; however, the batteries and battery acid were stored outside on a gravel driveway. According to the 1995 RFA, acid from these batteries was typically emptied into plastic containers and shipped to NSRR.

Although the start up date for this SWMU is unknown, it remains active. During the 1995 RFA (PREQB, 1995), nine batteries were stored at this site on the gravel driveway. No signs of any spills or leaks from these batteries were apparent, and no release controls were identified at this SWMU (PREQB, 1995).

During the CH2M HILL February 2000 site visit, release controls (plastic storage trays) for battery storage were present, but no batteries were stored at the site. No signs of releases of battery acid were observed.

2.4.2 Previous Investigation Results

No previous environmental sampling investigations have been performed at SWMU 5.

2.4.3 Sampling Rationale

Based on the review of the limited information available for the site, CH2M HILL will collect four surface soil samples (0 to 6 inches) at the locations shown in Figure 2-8. Samples will be analyzed for Appendix IX constituents and explosives. Although historical information for SWMU 5 does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, the potential for airborne migration of explosives residues via fugitive dust emissions, and the public concern of explosives and related residues at the AFWTF.

2.5 SWMU 6 – Waste Oil and Paint Accumulation Area (Seabees Area at Camp Garcia) and SWMU 7 - Waste Oil Accumulation Area (outside Building 303 at Camp Garcia)

2.5.1 Site Summary

During interviews with Navy employees in February 2000 and June 2000, it was confirmed that SWMU 6 and SWMU 7 are adjacent sites and will be investigated at the same time as one contiguous unit. The area encompassing these two sites currently consists of an open area, which contains a small covered chain-link cage and a concrete pad. Each SWMU is described below.

2.5.1.1 SWMU 6 Waste Oil and Paint Accumulation Area (Seabees Area at Camp Garcia)

According to the 1988 RFA, this area was used by the Seabees as a storage area for waste oil and paint. The waste oil at this location was containerized in 55-gallon drums, and the paint was housed in small containers. During the RFA, tires and two drums of lubricating oil were present at the site. The waste oil and tires were stored on a grassy area until they were shipped offsite to NSRR. The RFA states that this area became active in approximately 1978, and was still active in 1988. During the 1995 RFA (PREQB, 1995), signs of oil leakage onto the soil surface from the drums were visible, and no release controls were present at the site. During the CH2M HILL February 2000 site visit, no drums or waste materials were present at the site.

2.5.1.2 SWMU 7 Waste Oil Accumulation Area (Outside Building 303 at Camp Garcia)

SWMU 7 is a waste oil accumulation area located outside Building 303 at Camp Garcia. It was used by the U.S. Marines 3 months per year during training exercises. During these 3 months, Marines conducted training exercises at the EMA, and used the waste oil accumulation area to store waste oil from the maintenance of their vehicles. During the 1988 RFA, one open-top 55-gallon drum, a 25-gallon trash can, and two drums cut in half were present in the waste oil accumulation area. It was reported that the soil in the waste oil accumulation area was typically stained with waste oil as a result of spillage and leakage after vehicle maintenance procedures. Once the Marines completed their training, the stained soil was reportedly mixed with sand, excavated, containerized in 55-gallon drums, and shipped to NSRR.

During the 1995 RFA, drums full of waste oil were present in the waste oil accumulation area, the soil in the area was stained with oil, and no release controls were present. During the CH2M HILL February 2000 site inspection, no drums of waste oil or other material were present in the area.

2.5.2 Previous Investigation Results

A surface soil sampling investigation was conducted in June 2000 because of the transfer of NASD activities to Camp Garcia. Ten surface soil samples were collected around the cage and concrete pad as shown in Figure 2-9. The surface soil sampling results indicated that

arsenic, cadmium, and lead were detected above the RBCs. These results were provided in the August 1, 2000, Quarterly Report and will be presented in the Phase I RFI along with analytical results from the proposed Background Study.

2.5.3 Sampling Rationale

If arsenic, cadmium, and lead are determined to be naturally occurring in site soils based on results of the proposed background study, no additional sampling will be performed at SWMU 6 and SWMU 7. Risk-based screening results for the June 2000 sampling effort will be presented in the Phase I RFI Report along with the analytical results from the background study. The results from both investigations will be used to determine whether additional investigations are warranted at these SWMUs.

2.6 SWMU 8 – Waste Oil Accumulation Area (Observation Post 1, Inner Range, AFWTF)

2.6.1 Site Summary

SWMU 8 consists of a waste oil accumulation area, which is located outside the generator building at OP-1 on Cerro Matías of the AFWTF.

According to the 1988 RFA, the waste oil accumulation area contained drums of both waste lubricants and oils. The drums were stored on bare soil prior to being shipped offsite to NSRR. The accumulation area began operation in approximately 1978, and was still active in 1988. During the 1995 RFA, minor spills of lubricating oil onto the soil were present in the accumulation area, and no release controls were present (PREQB, 1995).

During the CH2M HILL February 2000 site inspection, no soil staining was evident in the accumulation area, and the drums were stored in plastic secondary containment trays for release control.

2.6.2 Previous Investigation Results

No previous environmental sampling investigations have been performed at SWMU 8.

2.6.3 Sampling Rationale

Based on the review of the limited information available for the site, CH2M HILL will collect five surface soil samples (0 to 6 inches) in the locations shown in Figure 2-10. Surface soil samples will be analyzed for Appendix IX constituents and explosives. Although historical information for SWMU 8 does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, and the public concern of explosives and related residues at the AFWTF.

2.7 SWMU 10 – Sewage Treatment Lagoons

2.7.1 Site Summary

According to the 1988 RFA, the sewage treatment lagoons for Camp Garcia went into service in the early 1950s. There are four unlined lagoons; two served as equalization/treatment lagoons, and two provided polishing treatment. The effluent from the final two polishing lagoons was then chlorinated in a chlorine contact chamber and discharged to the sea.

In the past, the lagoons were not lined. In 1974, after the level of activity and associated domestic wastewater generation rate significantly decreased at Camp Garcia, the treatment lagoon system was modified to make it a no-discharge system. The lagoons were lined using a 2-foot compacted clay and plastic liner system, and served as evaporation lagoons for the wastewater.

Although the presence of hazardous constituents in the sanitary wastewater is unlikely, this has not been confirmed through sampling. No known releases of hazardous constituents have occurred at this site (PREQB, 1995).

Inspection of the sewage lagoon system during the CH2M HILL February 2000 site inspection revealed that the lagoon system was overgrown with vegetation and did not appear to be active. In October 2000, the lagoon system was abandoned and a new wastewater lagoon treatment system was built approximately 500 feet west of the old lagoon system.

2.7.2 Previous Investigation Results

Because of the transfer of NASD activities to Camp Garcia, increased use of the sewage treatment plant was expected. CH2M HILL conducted a preliminary investigation at SWMU 10 in June 2000. Four surface soil samples (0 to 6 inches) and four subsurface soil samples (4 to 5 feet) were collected in each of the four lagoon areas. Additionally, one sample of the raw sanitary wastewater discharge to the lagoon system was collected. Sample locations are shown in Figure 2-11. The soil samples were collected for the purpose of determining if the lagoon material would be classified as hazardous waste. Toxicity characteristic leaching procedure (TCLP) analyses were performed on the soil samples. The results of the TCLP analyses of the soil indicated that the soil was not classified as a hazardous waste, and the analytical results for the wastewater sample did not indicate the presence of significant contamination. Results of these analyses were provided in the August 1, 2000, Quarterly Report and will be presented in the Phase I RFI Report.

2.7.3 Sampling Rationale

Based on the review of the site information, CH2M HILL will install five monitoring wells and collect five groundwater samples, 16 surface soil samples, and 16 subsurface soil samples. One monitoring well will be installed up-gradient of the lagoons and four wells will be installed downgradient of the lagoons. The screened depth of the proposed monitoring wells will be less than 10 feet below the first encountered groundwater. In general, shallow monitoring wells will be installed at depths where the screened intervals

are set to bracket the water table for the purpose of evaluating any potential free phase product accumulation that may exist.

Four surface (0-6 inches) soil and subsurface soil sample locations will be located in each quadrant of each lagoon. The subsurface soil samples will be collected immediately below the liner to determine if the liner has remained intact. The depth of the subsurface soil sample will be dependent on the depth to liner and can vary from one location to the other. Upon abandonment, the soil borings will be capped at the liner depth with a cement grout in order to maintain liner integrity.

Sample locations and monitoring well locations are also shown in Figure 2-11. The groundwater and surface soil samples will be analyzed for Appendix IX constituents and explosives. Although historical information for SWMU 10 does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, and the public concern of explosives and related residues at the AFWTF.

2.8 SWMU 12 – Solid Waste Collection Unit Area (Observation Post 1, Inner Range, AFWTF)

2.8.1 Site Summary

This area was formerly referred to as AOC B, but in accordance with the EPA Administrative Order of Consent, this area was designated as a waste management unit identified as SWMU 12. The aerial extent of SWMU 12 is illustrated in Figure 2-12. The solid waste unit collection area serves as a solid waste storage and transfer area, prior to pickup of the solid waste for disposal at the Vieques Island landfill. Containers used to store solid wastes collected at the site include wooden boxes, wooden trailers, and metal dumpsters and cans. During the 1995 RFA, only a wooden trailer was visible at this site (PREQB, 1995). Results of the recent visual inspection indicates that SWMU 12 currently consists of two trailers used for storage of domestic waste from OP-1 that is subsequently transported to the landfill at NSRR.

2.8.2 Previous Investigation Results

No previous environmental sampling investigations have been performed at SWMU 12.

2.8.3 Sampling Rationale

Based on the review of the information available for the site, CH2M HILL will collect five surface soil samples around the waste collection units as shown in Figure 2-13. Samples will be collected from a depth of 0 to 6 inches, and the results will be used to determine if a release of hazardous materials has occurred at the site. Soil samples will be analyzed for Appendix IX constituents and explosives. Although historical information for SWMU 12 does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, and the public concern of explosives and related residues at the AFWTF.

2.9 AOC A – Diesel Fuel Fill Pipe Area (Observation Post 1, Inner Range, AFWTF)

2.9.1 Site Summary

According to the 1988 RFA, this area contained the fill pipe for the underground storage tank (UST) located at the OP-1 in the Cerro Matías area of the AFWTF. The UST was located 25 feet southwest and downgradient of the fill pipe. An aerial map showing AOC A is provided as Figure 2-14.

The UST and the fill pipe were first put into service in approximately 1978. During the 1995 RFA, the soil surrounding the fill pipe was stained, apparently as a result of fuel spills that had occurred during tank refueling. The total impacted area was approximately 6 feet by 6 feet. No fuel releases from the UST were apparent, and no release controls were found at this site (PREQB, 1995).

The UST, associated piping including the fill pipe, and surrounding soil were excavated and removed for disposal in 1997. Four confirmation soil samples were collected from the excavation and analyzed for petroleum-related constituents. No petroleum-related constituents were detected in any of the four soil samples. The UST was replaced with a new UST. The closure report describes where the four samples were collected, but does not include sample collection depths or actual collection locations. Appendix A provides the UST Removal Closure Report. The closure report was not prepared until April 2000 after comments were received from PREQB.

2.9.2 Previous Investigation Results

The confirmation soil sampling conducted during the 1997 UST replacement at the site did not indicate the presence of any petroleum-related constituents. Figure 2-15 shows the area of the tank replacement and excavation of soils.

2.9.3 Sampling Rationale

Because the soil surrounding the UST and associated piping, including the fill pipe, was excavated and removed for disposal during the 1997 tank replacement, and because the confirmation soil sampling conducted during the tank replacement did not indicate the presence of petroleum-related constituents, no further action is proposed for this site.

2.10 AOC F – Rock Quarry (Camp Garcia)

2.10.1 Site Summary

The rock quarry is located southwest of the former Camp Garcia landfill. This site is used to obtain gravel used by the Navy for the construction of roads and other construction projects. During the 1995 RFA, used tires and some paper waste were visible at this location (PREQB, 1995). During the CH2M HILL February 2000 site inspection, no waste tires or other waste materials were observed at the quarry, and the quarry did not appear to be active. No additional historical usage information is available for this AOC. Figure 2-16 provides an aerial view of AOC F.

2.10.2 Previous Investigation Results

Because of the transfer of activities from NASD to Camp Garcia, the rock quarry may continue to be used for road maintenance activities. CH2M HILL conducted an investigation in June 2000 to determine if hazardous constituents existed in the surface soil where Navy personnel will remove quarry material. Five surface soil samples were collected from the areas illustrated in Figure 2-17. The samples were analyzed for Appendix IX parameters and explosives. Analytical results from this effort were provided in the August 1, 2000, Quarterly Report and will be included in the Phase I RFI Report. The surface soil sampling results indicated that only arsenic was detected above RBCs. As discussed throughout this document, the presence of arsenic in the soil is likely to be naturally occurring given the volcanic origin of the soils on the island.

2.10.3 Sampling Rationale

Results of the proposed background study will be used to determine the background levels of metals occurring naturally at the site. If arsenic is determined to be naturally occurring in site soils, no additional sampling will be performed at AOC F at this time. Risk-based screening and analytical results for the June 2000 sampling effort will be presented in the Phase I RFI Report along with the analytical results of the proposed background study. The results from both investigations will be used to determine whether additional investigations are warranted.

2.11 AOC G – Pump Station and Chlorination Building at Sewage Lagoons (Camp Garcia)

2.11.1 Site Summary

This site, which is located adjacent to the sewage treatment lagoons at Camp Garcia, consists of a building that housed a pump station and chlorination equipment used in the past for the chlorination of the lagoon system effluent. These facilities were placed into operation in the 1950s and are no longer in service. Figure 2-18 provides an aerial view of AOC G. The building is constructed of concrete, and is built partially below grade. During the 1995 RFA, stains were visible on the concrete floor in the building, reportedly as a result of wastewater overflows. However, no signs of vegetation stress or staining were apparent in the grassy area surrounding the building (PREQB, 1995).

During the CH2M HILL February 2000 site inspection, no staining was observed in the chlorination building, and the site was inactive and overgrown with vegetation.

2.11.2 Previous Investigation Results

No previous environmental sampling investigations have been performed at AOC G.

2.11.3 Sampling Rationale

Based on the review of the information available for the site, CH2M HILL will collect five surface soil samples in the area of the chlorination building and the nearby chlorine contact chamber as shown in Figures 2-19 and 2-20. The surface soil samples will be collected from a depth of 0 to 6 inches, and the results will be used to determine if a release of hazardous materials has occurred at the site. The surface soil samples will be analyzed for Appendix IX constituents and explosives. Although historical information for AOC G does not indicate the potential presence of explosives or related residues at this site, explosives are included in the sample analyses because of the use of explosives in the range areas of the AFWTF, and the public concern of explosives and related residues at the AFWTF.

2.12 Photo-Identified Site Investigation

2.12.1 Site Summary

An aerial photo analysis was completed in August 2000 (ERI, 2000). Aerial photographs dated 1937, 1959, 1962, 1964, 1967, mid-1970s, and 1985 were evaluated. This analysis documents activity in both the EMA and the AFWTF, including the nine known SWMUs, three known AOCs, and 23 other potential sites identified on the photographs. These sites are referred to as photo-identified areas or PIs. Figure 2-21 was developed as part of this investigation and shows the locations of all identified SWMUs, AOCs, and PIs within the EMA and AFWTF. Table 2-1 lists each site, years active, and a brief description of each site. Table 2-2 presents a detailed description of the aerial photographic analysis findings for each site by year.

2.12.2 Investigation Rationale

During the Phase I RFI, each PI will be visually inspected and Navy personnel will be interviewed to determine whether further investigation is warranted. Results of these investigations will be addressed in the Draft Final RFI Report.

2.13 Potential Areas of Concern (PAOC) Investigation

2.13.1 PAOCs Identified During Site Visit

During the June 2000 site visit with personnel from NASD, four PAOCs were identified. These PAOCs have been designated as PAOCs I, J, K, and L, respectively. They are located either inside or near the Camp Garcia Compound:

- **PAOC I:** Former power plant and mechanics shop northeast of Bldg. 303 at Camp Garcia (structure still exists)
- **PAOC J:** Former vehicle maintenance area at Camp Garcia (all structures were demolished prior to 1980)
- **PAOC K:** Former wash rack area north of main road (structure demolished prior to 1980)
- **PAOC L:** Former paint and transformer storage area (structure still exists)

Figure 1-2 (presented previously) shows the vicinity of these PAOCs.

A preliminary literature search indicated that little or no information was available for these additional facilities.

TABLE 2-1

Aerial Photographic Analysis – Identified Sites
Camp Garcia/Vieques

Site	Year(s)	Active Brief Description
SWMU 1	1959-post 1964	Camp Garcia Landfill. Debris noted in trenches and fill areas from 1959 to 1964. Inactive by mid-70s.
SWMU 2 1959	1959 -mid- 1970s	Fuels Off-Loading Site. Vertical tanks, containers, staining and light-toned material noted.
SWMU 4	Mid-1970s- 1994	Waste Areas of Building 303. No significant findings were noted within the Building 303 Area (see Camp Garcia for other open storage areas and features noted within this vicinity).
SWMU 6 & 7	Mid-1970s-1994	Waste Oil and Paint Accumulation Areas. No significant findings were noted within this area (see Camp Garcia for other open storage areas and features noted within this vicinity).
Camp Garcia	1959-1994	Open storage, containers, debris, staining and a burn area were noted within Camp Garcia.
SWMU 5, 8, 12 & AOC A	1962-1994	Spent Battery Accumulation Area (SWMU 5), Waste Oil Accumulation Area (SWMU 8), Solid Waste Collection Unit (SWMU 12), and Diesel Fuel Fill Pipe (AOC-A). Dark-toned or burned area noted in 1962. Containers, possible debris and light-toned material noted within the site area. A probable pipeline, staining, ground scars, probable containers, a probable fill area and buildings were noted onsite.
SWMU 10 and AOC G	Mid-1970s- 1985	Sewage Treatment Lagoons and Pump/Chlorination Building. Four lagoons (SWMU 10), Chlorination Building (AOC-G), piping and series of ditches noted in mid-1970. Area beginning to re-vegetate in 1985.
AOC F	1959-1994	An excavation with dark-toned staining visible in 1959. Probable debris, lighttoned material and light-toned objects noted in 1962 and 1964. New excavation activity noted in 1994.
PI-1	1937-1985	Persistent ground scarred area.
PI-2	1959-1985	Persistent ground scar, discolored soil.
PI-3	1959-mid-1970s	Persistent ground scar. Re-vegetated by 1985.
PI-4	1959-1964	Series of trenches and disturbed ground. Trenches filled/covered by 1962. An area of disturbed ground is visible within the southeast corner of this area in 1964.
PI-5	1959-1964	Ditches from airfield lead to cleared areas and a possible fill area near and into Puerto Ferro.
PI-6	1959-1994	Vertical tanks, large surface impoundment and pump house at probable water treatment plant. Impoundment no longer visible by 1985.
PI-7	1959-1994	Persistent ground scarred areas.
PI-8	1959-mid- 1970s	Open storage, vehicle and equipment maintenance area, staining.

TABLE 2-1 (CONTINUED)

Aerial Photographic Analysis – Identified Sites

Camp Garcia/Vieques

Site	Year(s)	Active Brief Description
PI-9	1959-1964 – storage area; 1959-1994 – fill area	Open storage of probable munitions/explosives. Fill with debris located east of storage area.
PI-10	1962-1964	Series of four impoundments with liquid.
PI-11	PI-11 1962	Access road leading to probable fill area with possible containers.
PI-12	Mid-1970s-1994	Light-toned material in cleared area.
PI-13	Mid-1970s	Light-toned material in excavation. Re-vegetated by 1985.
PI-14	Mid-1970s	Two pits with light-toned material and possible debris.
PI-15	Mid-1970s – 1994	Pit with liquid. Access road leads to pit.
PI-16	1962	Access roads leading to circular area of disturbed ground and light-toned material, possible burial area.
PI-17	1962	Pits, possible fill area, debris.
PI-18	Mid-1970s	Excavation/possible fill area. Area re-vegetated by 1985.
PI-19	Mid-1970-1985	Disturbed ground. Filled/graded by 1985.
PI-20	1964-1985	Disturbed ground, possible fill area.
PI-21	1959-Mid-1970s, 1994	Vertical tank, pits, disturbed ground. Possible quarry activity; however, pits contained discolored liquid (brown, green). Re-vegetated by 1985. New clearing and grading activity noted in 1994.
PI-22	1994	Possible debris and excavations with liquid noted in 1994.
PI-23	1959-1967	Large pit that did not appear to be a foxhole-training pit noted from 1959 to 1967.

TABLE 2-2

Aerial Photograph Chronological Analysis of Pls
Camp Garcia/Vieques

Date	Frame #	Site	Description
1936-37	K-25-87	PI-1	Ground scarred area.
1959	23	PI-1	Ground scarred area and light-toned material.
1962	614	PI-1	Ground scarred area remains.
1967	22DD-189	PI-1	Ground scarred/stained area.
Mid-1970	126	PI-1	Ground scar remains.
1985	1-14	PI-1	Re-vegetating.
1959	25	PI-2	Ground scarred area.
1962	9789	PI-2	Area remains scarred. Ground surface is discolored (gray/black).
1964	13DD-156	PI-2	Ground scarred/disturbed ground remains.
Mid-1970	85	PI-2	Ground scar.
1985	1-11	PI-2	Ground scar remains.
1959	25	PI-3	Ground scarred area, probable pits.
1964	13DD-156	PI-3	Ground scar/disturbed ground remains.
Mid-1970	85	PI-3	Majority of ground scar re-vegetating.
1959	26	PI-4	Trench with possible debris. Several probable trench scars nearby (gone by 1962).
1964	13DD-158	PI-4	Trenches seen in 1959 are no longer visible. An area of disturbed ground (possibly a fill area) is visible south of the former trench area.
1959	26	PI-5	Airfield staining and associated ditch to Puerto Ferro. An access road leads to a cleared area at the edge of Puerto Ferro, just west of the ditch. An excavation with liquid is noted farther west.
1962	9783	PI-5	Stained area no longer present. Ditches to Puerto Ferro remain. Access road leads to cleared area at edge of Puerto Ferro.
1964	13DD-158	PI-5	Ditch to Puerto Ferro remains. Receives runoff from airfield and PI-8 (open storage area).
1959	26	PI-6	Probable treatment plant. Impoundment with liquid, vertical tanks and six buildings are present. One of the six buildings located in the eastern portion of the site appears to be a pump house.
1962	9783	PI-6	Impoundment empty. Tanks remain.
1964	13DD-158	PI-6	Tanks and impoundment remain.
1985	1-09	PI-6	Five vertical tanks and a building are visible. The impoundment area has completely re-vegetated.
1994	26	PI-6	Four vertical tanks and several small structures are visible.
1959	26	PI-7	Persistent ground scarred areas.
1964	13DD-158	PI-7	Ground scarred/disturbed ground.

TABLE 2-2 (CONTINUED)

Aerial Photograph Chronological Analysis of Pls
Camp Garcia/Vieques

Date	Frame #	Site	Description
1985	1-09	PI-7	Ground scarred areas remain.
1994	26	PI-7	Ground scar remains; however, is significantly smaller in size.
1959	26	PI-8	Vehicle and equipment storage, maintenance area, and staining.
1962	9785	PI-8	Open storage of vehicles, equipment and multi-colored materials (some probably metallic). Heavy staining noted south of probable maintenance buildings. Light-toned material and staining noted in eastern portion of site.
1964	13DD-158	PI-8	Vehicle and equipment storage remains. Probable metallic material remains to the south. Staining noted to east.
Mid-1970	83	PI-8	Only a small amount of open storage materials remain. Probable staining is noted on the north side of a probable maintenance building. The southern portion of the site appears inactive.
1985	1-09	PI-8	Inactive.
1959	26	PI-9	Open storage of probable explosives in partially bermed areas (see 1962 for details). Fill area with possible debris is noted at edge of Puerto Ferro and likely associated with the explosives storage area to the west.
1962	9783	PI-9	Open storage of probable explosives and containers in bermed areas. Disposal of white material noted in large trench at north end of site. Fill area to the east has increased in size since 1959. Debris is visible along the northern end of the fill area.
Mid-1970	114	PI-9	Majority of storage area is re-vegetating. Fill area remains. Debris not discernible.
1985	1-09	PI-9	Majority of storage area remains vegetated. A probable pit is visible to the west. Fill area/possible debris visible to the east.
1994	26	PI-9	Ground scar. Fill area to the east remains. Vegetation growth healthy along northern end of fill area.
1962	9785	PI-10	Series of six lagoons containing brown to black liquid. Liquid is also visible outside the lagoons to the north.
1964	13DD-158	PI-10	Lagoons inactive – re-vegetating. Site still not completely re-vegetated by 1985. Completely re-vegetated by 1994.
1962	9785	PI-11	Disturbed ground/possible containers at the end of access road.
Mid-1970	23	PI-12	Light-toned material noted in cleared/disturbed area (still present in 1985).
1985	2-35	PI-12	Light-toned material in cleared area remains.
1962	9783	PI-5	Stained area no longer present. Ditches to Puerto Ferro remain. Access road leads to cleared area at edge of Puerto Ferro.
1964	13DD-158	PI-5	1994 26 PI-12 Cleared area remains. Light-toned residue (not annotated) is visible along the eastern portion of the site.
Mid-1970	114	PI-13	Light-toned material present in excavation. Linear excavations and/or pits line an access road to the southwest.

TABLE 2-2 (CONTINUED)

Aerial Photograph Chronological Analysis of Pls
Camp Garcia/Vieques

Date	Frame #	Site	Description
1985	1-09	PI-13	Re-vegetated.
Mid-1970	114	PI-14	Two pits with possible debris and light-toned material.
Mid-1970	90	PI-15	Pit with probable liquid is visible. An access road can be seen leading to pit.
1985	2-37	PI-15	A large pit with liquid is visible within the Maneuver Area. An access road is visible leading to the pit.
1994	22	PI-15	Majority of pit has re-vegetated. Light-toned material is noted in the eastern portion of the pit.
1962	616	PI-16	Disturbed ground, light-toned material. Possible burial area.
1962	9795	PI-17	Pits, possible fill area and debris. Re-vegetated by 1985.
Mid-1970	83	PI-18	Excavation, possible fill area
1985	1-11	PI-18	PI-18 Area is re-vegetating.
Mid-1970	83	PI-19	Large ground scarred/disturbed area –graded/cleared by 1985.
1985	1-11	PI-19	Area is cleared and graded. Light vegetation growth is visible over the cleared area.
1964	13DD-156	PI-20	A possible fill area containing possible debris is visible.
Mid-1970	118	PI-20	Possible fill area.
1985	1-11	PI-20	Possible fill area remains.
1994	26	PI-20	Fill area re-vegetating.
1959	26	PI-21	Area of disturbed ground with two probable trenches.
1962	9787	PI-21	Disturbed ground with two pits. One of the pits contains brown liquid. The southern pit contains green liquid. A vertical tank and vehicles and equipment are also visible. A larger area of disturbed ground is visible northwest of the site; however, no debris or pits are visible.
1964	13DD-156	PI-21	Pits no longer visible. Vehicles and probable quarry equipment is visible.
Mid-1970	118	PI-21	Site appears inactive – re-vegetating.
1985	1-11	PI-21	Area appears inactive and re-vegetating.
1994	26	PI-21	New cleared/graded area visible.
1994	22	PI-22	Possible light-toned debris is evident in a wooded area near a launch point. Two excavations with light-toned liquid are visible south of possible debris.
1959	26	PI-23	Large pit with liquid noted near road intersection.
1962	599	PI-23	Large pit noted near road intersection. Does not appear to be foxhole or impact crater.
1967	22DD-195	PI-23	Pit remains.

2.13.2 Navy Records Search

The Navy conducted a review of the building construction and demolition records for the EMA in an effort to identify buildings or other structures that may have stored hazardous waste. No records of spills or releases of hazardous waste were identified during the records search.

The demolition records search identified several structures that could have posed a threat to the environment, including a filling station, several boilers, and firing ranges. However, the locations of these structures are uncertain. These identified non-range structures are considered PAOCs and will be investigated during the Phase I RFI. Table 2-3 summarizes demolition records search information as it pertains to designated PAOC sites.

TABLE 2-3

PAOCs Identified: from the Demolition Records Search

Camp Garcia/Vieques

Building Type	Facility Number	Date Built	Date Demolished	Description/Comments
Dispatch office/fuel (PAOC)	4503	1986	December 1991	Dispatch office, fuel facility, sleeping quarters
Filling station by Building 4503 (PAOC)	-	1985	November 1992	Fuel farm, filling station
Boiler Room (PAOC)	238CG	1953	September 1989	Heating Plant Building
Pump House (PAOC)	500CG	1953	September 1989	Water Treatment Facility Building
Boiler House (PAOC)	607	1963	September 1984	Heating Plant Building
Boiler House (PAOC)	617	1970	January 1984	Heating Plant Building
Petroleum, Oil, and Lubricants (POL)	-	1969	September 1984	POL Pipeline
Pipeline (PAOC)				
Mech. Shop – Grounds (GRDS)	305	1975	December 1991	Public Works (PW) storage shed
Contractor (PAOC)				

2.13.3 Site Evaluation

Additional record searches will be conducted during the Phase I RFI for each of the 12 identified PAOCs (four identified from a site visit, eight identified from the Navy records search). If additional interviews and site inspections verify that a release of hazardous material has occurred at a site, the site will be added as an AOC. Results of these investigations will be addressed in the Draft Final RFI Report.

The 12 Potential Areas of Concern (PAOCs) will be evaluated by the following: 1) conduct an archive review of historical documents and aerial photos; 2) if the site can be located conduct a site inspection to assess if there is any physical evidence of prior releases (i.e. soil staining, stressed vegetation); 3) at each POAC where the archive research or site inspection provides evidence of release of hazardous substances, then up to three surface soil samples will be collected at each potentially impacted site for analysis of RCRA Appendix IX constituents; 4) compare the soil analyses with background levels and risk-based screening criteria; and 5) present the results in the RFI Phase I Draft Final Report. If there is no evidence of either use or release of hazardous constituents then no additional sampling will be completed. If there is evidence of a release, then subsurface soil samples and groundwater samples will be collected.